

## **Addendum A**

### **Building Energy Efficiency**

- 1. Building Envelope Technologies.** Demonstrated expertise with: (1) residential envelope issues, including insulation types and effectiveness, glazing, fenestration types and performance; (2) whole building design concepts; (3) indoor air quality issues; (4) diagnostic tools/strategies currently available; (5) the engineering of high efficiency systems for entire buildings; (6) commissioning the building and (7) measuring and tracking performance over time.
- 2. Lighting Technologies.** Demonstrated expertise with lighting for productivity, daylighting strategies, lighting technologies, including high efficiency lamps and state of the art controls (including sensor and control systems in both new and retrofit applications), light-managing glazings, commissioning, and measuring and tracking performance over time.
- 3. Space Conditioning Technologies.** Demonstrated expertise with electric, gas and geothermal heat pumps, active and passive solar space conditioning systems, other space conditioning systems, ventilation technologies, thermal distribution systems, and alternative equipment concepts and control systems, commissioning, and measuring and tracking performance over time.
- 4. Water Heating Technologies.** Demonstrated expertise with water heating systems including system types, distribution strategies, and whole system design approaches, commissioning, and measuring and tracking performance over time.
- 5. Appliance and Office Technologies.** Demonstrated expertise with energy efficient appliance technologies, office equipment, and entertainment devices, including current issues of standby power losses and equipment “low power modes”.
- 6. Building Energy Efficiency Standards.** Demonstrated expertise in the development of and the compliance with the Title 24 Building Energy Efficiency Standards, including experience assessing new technologies for their applicability in future Standards.
- 7. Appliance Energy Efficiency Standards.** Demonstrated expertise in the development of and the compliance with the Title 20 Appliance Standards, including experience assessing new technologies for their applicability in future Standards.

- 8. Building Energy Simulation Modeling.** Demonstrated expertise in building energy simulation programs, the derivation of new simulation models for energy efficient technologies and/or strategies, and the validation of models with field monitored data.
- 9. Whole Building Energy Benchmarking.** Demonstrated expertise in the development and use of software that provides comparative information on building energy performance, including statistical approaches to derive models of regional and/or national building energy performance.

### **Energy Systems Integration**

- 10. Demand Responsive Technologies and Systems.** Demonstrated expertise with: (1) the technologies that aid customers' ability to respond to varying prices and energy availability, in real time; (2) the integration issues/opportunities using tariffs, meters, on-site energy storage, innovative communication, customer devices that respond automatically; and (3) building fault detection diagnostics and building commissioning strategies.
- 11. Evolving Electric and Natural Gas Markets.** Demonstrated expertise in the new emerging California electricity and natural gas markets, including generation, distribution, "green power," and end-use technologies markets, in terms of the impacts of the markets on the electric generation community, consumers and other energy market participants, and the various contributions and economic impacts.
- 12. Strategic Electricity System Research.** Demonstrated expertise in identifying "disruptive" technologies that offer potential "orders of magnitude" advances including (1) innovative projects resulting in "revolutionary" (vs. "evolutionary") technological advances; and (2) "enabling" technologies - core concepts that create numerous opportunities for the development of components, subsystems, products and services. Demonstrated expertise in conducting RD&D investigations preliminary to full RD&D efforts.
- 13. Energy System Integration.** Demonstrated expertise with: (1) the economic and technical inter-dependencies of power generators, T&D systems, ISO's, and customers; (2) the tools required to manage the exponential increase in retail transactions since electricity restructuring; and (3) the economic and technical inter-dependencies of natural gas infrastructure and electricity produced from natural gas.
- 14. Quantification of Benefits for Distributed Generation, Storage, Renewables and other End Use Energy Technologies.** Demonstrated expertise in benefit valuation of distributed generation, electricity and natural gas storage, renewable technologies and energy efficiency,

energy management, and demand responsiveness technologies beyond those captured in energy and capacity value.

**15. Transmission/Distribution Technologies and Power Electronics.** Demonstrated expertise with: (1) new electric transmission and distribution technologies (including high voltage DC transmission technologies) which help improve electric systems capabilities (e.g., Flexible Alternating Current Transmission System (FACTS), SCADA, dynamic line ratings, etc), reduce congestion, mitigate harmonics and other power quality effects, and improve the load factors of the electrical T&D systems; (2) transmission and distribution protection systems and hardware, with emphasis on relay protection systems; (3) kilo-Volt-Ampere (kVA), kilo-Volt-Ampere reactive (kVAr), harmonic and unbalanced power interactions on transmission and distribution systems; (4) solid state power electronics (thyristors, etc.) and their role in electrical generation, transmission, distribution and controls; (5) familiarity with the issues related to development and deployment of power electronics; (6) communications and controls technologies that facilitate the integration of new automated distribution equipment, demand response and distributed generation into the distribution system; (7) asset management expertise focused on designing, extending and maintaining T&D infrastructure efficiently and cost-effectively; and (8) implementation of modular equipment to support rapid grid recovery.

**16. Power Quality Technologies.** Demonstrated expertise with state-of-the-art developments in: (1) design standards, guidelines, technologies and techniques to mitigate equipment-generated harmonics and other equipment effects that degrade on-site power quality; (2) technologies to improve the quality of power delivered to a site, such as uninterruptible power supplies, surge suppressors, filters, K-factor transformers, and line reactors; and (3) on-site energy storage technologies. Also, demonstrated expertise with the assessment of benefits and costs associated with the loss of electrical reliability and power quality.

**17. Energy Metering Technologies and Pricing Strategies.** Demonstrated expertise related to electricity, natural gas and liquid fuels with: (1) emerging metering technologies; (2) the factors which are shaping the current metering functions at various customer class levels (examples of metering technologies are real-time pricing, time-of-use, and communications technologies affecting metering practices, metering of total, real, reactive, harmonic and unbalanced power and the various methods of calculating these for electricity); (3) the effects of different electric power types on various customer classes; and (4) pricing strategies that encourage efficient use of resources.

**18. Electricity and Natural Gas Utility Planning, Business and Management.** Demonstrated knowledge of standard best practice engineering and planning methods that are widely used by utilities around the world. Demonstrated knowledge of T&D system planning and

business-case studies specializing in "high impact" and strategic studies that are linked to bottom-line results. Expertise developing new distribution Business Models that will support the integration of Distributed Energy Resources and new infrastructure that will improve reliability and system flexibility. Expertise in asset management.

**19. Security Vulnerabilities Analysis and Mitigation and Security Technology.**

Demonstrated expertise in identifying, analyzing and mitigating vulnerabilities now present in unprotected configured SCADA systems. Demonstrated expertise in Critical Infrastructure Energy Systems modeling, specifying, cyber encrypting SCADA, EMS, Data Collection System (DCS), Motor Control Centers (MCC), Remote Terminal Units (RTU) and substation switchgear, and valves. Ability to develop metrics to evaluate the value of security models and technologies in hardening the Energy Critical Infrastructure System (Electrical and Gas).

**Environmentally Preferred Advanced Generation**

**20. Reciprocating Engines.** Demonstrated expertise with the design, engineering, manufacturing, regulations, performance and economics associated with internal combustion and compression ignition reciprocating engines including: (1) fuel injection; (2) ignition; (3) combustion rates; (4) chamber geometry; (5) emissions; (6) detonation; (7) charge preparation; (8) timing; (9) seal design; (10) operating speed; (11) aspiration; (12) turbochargers; (13) superchargers; (14) intercoolers; (15) operation on various fuels (liquid, natural gas, biogas, syngas and hydrogen-enriched); (16) advanced cycles; and (17) sensors and controls.

**21. Coal Technologies.** Demonstrated expertise on technological status, costs, performance and environmental issues associated with: (1) processing and cleaning Western Coal; (2) coal transportation systems; (3) coal feeding; (4) coal combustion and gasification technologies; (5) co-firing; and (6) emissions and emissions control technologies, including carbon dioxide sequestration, for electricity generation and industrial applications.

**22. Fuel Cell Technologies.** Demonstrated expertise with: (1) fuel cell technologies and systems, including: (a) phosphoric acid; (b) molten carbonate; (c) solid oxide; and (d) proton exchange membrane fuel cell technologies; (2) hybrids, including hybrid system modeling; and (3) associated development issues, including (a) alternative materials and processing techniques for cell stack components; (b) efficiency improvement; (c) fuel reforming, processing, and fuel flexibility; (d) balance of system design and integration; (e) thermal management, waste heat recovery and combined heat and power; (f) system control and dispatch; (g) power conditioner units; and (h) manufacturing cost reduction.

**23. Combined Cooling, Heating and Power (CCHP) Technologies and Applications.**

Demonstrated expertise in: (1) topping and bottoming cycles, including waste heat and pressure recovery; (2) combustion turbines; (3) steam turbines; (4) packaged systems fueled by natural gas, Liquefied Natural Gas (LNG), distillate and renewable fuels; (5) duct burners; (6) power-to-heat ratios for various end-use applications and by Standard Industrial Code; and (7) market potential.

**24. Combustion Processes and their Emissions.** Demonstrated expertise with and analysis of the design, engineering, performance, economics and emissions associated with different combustion components, systems and processes for natural gas, biogases, liquid fuels and hydrogen-enriched fuels in reciprocating engines, Stirling engines, microturbines, gas turbines, duct burners and boilers.

**25. Computer Modeling and Analysis.** Demonstrated expertise in designing, using and validating computer simulation models as applied to combustion reactions and processes, electrochemical reactions, microturbines, small turbines, reciprocating engines, fuel cell systems, CCHP systems tapping and bottoming cycles and hybrid generation systems.

**26. Central Station Power Plant Alternatives.** Demonstrated knowledge of the engineering, economic, financial, siting, environmental, and regulatory aspects of large (> 100 MW) power plants and emerging system concepts that have the potential to replace California's aging power plants.

**Environmentally-Related Energy Research**

**27. Energy-Related Environmental Research.** Demonstrated expertise with: (1) how energy production, delivery and use affect various aspects of the environment, such as: (a) the quality of air, (b) the quality and availability of water resources, (c) the populations and habitat of aquatic and terrestrial wildlife and plants; (d) aesthetic response to the viewer; (e) the occurrence of hazardous materials and toxic wastes; (f) cultural resources; and (g) recreational resources; (2) the cost impacts of the environmental effects in California; and (3) how new energy applications and products can solve environmental issues.

**28. Pollution Abatement/Regulations.** Demonstrated expertise related to electricity, natural gas and transportation with (1) control technologies for criteria and non-criteria pollutants for power plants, back-up systems, and cogeneration systems, including the impacts of pollution control equipment on power plant life cycle cost, reliability, and downtime; (2) regulatory and legislative trends, including Public Utilities Holding Company Act (PUCHA), FERC actions, Environmental Protection Agency (EPA) and State of California regulations

governing air and water pollution and solid waste management; and (3) assessment of the impacts of regulations on generating system choice, fuel choice and fuel switching.

**29. Air Quality Issues.** Demonstrated expertise with: (1) air quality regulatory issues as they relate to natural gas, transportation and power generation, including short-range and long-range dispersion of pollutants, atmospheric chemistry, and characterization of emission profiles for point and area sources; and (2) air quality research initiatives in California.

**30. Global Climate Change.** Demonstrated expertise with: (1) the different issues surrounding the global climate change debate research area; (2) economic modeling; (3) greenhouse gas (GHG) emission inventories; (4) options needed to reduce GHG emissions; and (5) potential ecological impacts due to global climate change.

**31. California Environmental Quality Act (CEQA).** Demonstrated expertise with: (1) local, regional, state, and federal environmental laws, including CEQA; (2) preparation of environmental documents under CEQA such as a negative declaration and environmental impact report; and (3) CEQA process and project permitting.

## **Industry, Agriculture and Water**

**32. Industrial Refrigeration.** Demonstrated expertise (including sizing and specification) with industrial refrigeration as used in multiple industrial categories.

**33. Industrial Fluid Separation Technologies.** Demonstrated expertise with advanced membranes, distillation and other separation technologies used commonly in industry.

**34. Industrial Heat Transfer.** Demonstrated expertise in industrial processes and equipment, including: (1) heat exchangers, heat recovery steam generators, and waste heat recovery; (2) boilers and boiler retrofits; and (3) furnaces.

**35. Industrial Electrical Energy Efficiency & Demand Reduction.** Demonstrated expertise (including sizing and specification) with improving industrial energy efficiency, including: motors and variable speed drives (understanding of issues that affect motor efficiency); Use of Programmable Logic Controllers for managing industrial loads and processes. Industrial Process Controls and Sensors: Demonstrated expertise with advanced process controls and sensors; Experience and knowledge of demand reduction using load management strategies and equipment including electricity energy storage, and other distributed energy resources.

**36. Industrial Process Heat.** Demonstrated expertise (including sizing and specification) particularly in (1) petrochemical refinery processes; (2) chemical industry processes; (3)

Food Processing Industry; (4) Metal Casting & Furnaces & Foundries and (5) Glass and Cement industry. In addition demonstrated expertise in emission control technologies.

- 37. Energy use in High-Tech Buildings.** Demonstrated expertise in the energy use in data centers, laboratories, clean rooms and in understanding of issues unique to buildings housing such facilities.
- 38. Agricultural End-Use Technologies.** Demonstrated expertise with: (1) agricultural energy technologies that reduce costs through energy management practices, efficiency technologies, improved equipment and materials, monitoring and control technologies; and product and process improvements; and (2) strategies that remove or minimize environmental problems associated with agricultural processes and wastes.
- 39. Water Treatment.** Demonstrated expertise with (1) current and emerging potable and waste water treatment technologies, including industrial and agricultural waste water effluents; and (2) current and emerging water treatment practices and new technologies for water conservation and energy efficiency.
- 40. Water Management.** Demonstrated expertise with: (1) water management; (2) current operational practices and new technologies and procedures that help improve water conservation and energy efficiency; (3) integration with the energy infrastructure; and (4) metering technologies and pricing strategies that encourage efficient use of resources
- 41. Solar Industrial Process Heat Technologies.** Demonstrated expertise with solar technologies to provide medium and high temperature process heat for commercial, industrial and agricultural applications, including deployment issues and barriers to commercialization.
- 42. Industrial Thermal Energy Use Efficiency.** Demonstrated expertise in the design & operation of combustion equipment (e.g boilers, burners, furnaces), heat exchangers and heat treatment equipment and technologies used in industrial operations; knowledge of advanced technologies and other RD&D opportunities to improve the efficiency of thermal energy use (primarily natural gas) in the industrial setting; and demonstrated expertise in waste heat recovery and cascading thermal quality.
- 43. Industrial Power Quality Applications.** Demonstrated knowledge on the types of power quality disturbances that impact industrial operations (harmonics, voltage sags, voltage swells, power surges, momentary interruptions, etc.) and an ability to assess energy efficiency impact. Demonstrated knowledge of the mitigation devices and products available to address these disturbances (surge suppression devices, active and passive harmonics filters, power conditioning devices, etc.).

**44. Industrial Energy Audits.** Demonstrated experience at completing energy conservation, efficiency and peak load reduction audits and site assessments at industrial and agricultural end customer locations. Knowledgeable in the installation, use and removal of energy measurement and monitoring devices. Knowledge and experience in measurement & evaluation methodologies for assessing program effectiveness.

**45. Industrial Energy Storage Applications.** Demonstrated understanding of the end user business decision process to assess the value of installing energy storage, distributed generation and combined heat and power (CHP) technologies for industrial operations reliability improvements, industrial plant peak load reduction, improved industrial operational energy efficiency, demand response program participation and others.

## **Renewables**

**46. Geothermal.** Demonstrated expertise with (A) Geothermal Electric Generation such as (1) vapor-and liquid-dominated electric generation technologies, including wellhead units; (2) distributed generation geothermal technologies (e.g., less than 20 MW in capacity); (3) alternative thermodynamic cycles; (4) efficiency improvements; (5) well design; (6) applications; and (7) pollution abatement; (B) Direct Use Applications; (C) Geothermal Heat Pump Technologies (GHP), including heat exchangers; (D) Geothermal Resource (1) assessment and exploration; (2) production and injection wells; (3) reservoir engineering and modeling; and (4) experience with hot water and steam reservoirs, magma systems, geo-pressured systems and hot dry rock.

**47. Biomass Electric Generation and Municipal Solid Waste (MSW) Technologies.** Demonstrated expertise with: (1) biomass harvesting, collection, processing, feeding and combustion, especially for high moisture and high ash/or high alkali fuels; (2) biomass combustion, gasification, pyrolysis, fermentation (biomass-to-ethanol), and anaerobic digestion (i.e., specifically including landfill gas to energy, wastewater treatment gas to electricity and livestock manure gas to electricity technologies); (3) advanced biomass energy conversion techniques; (4) biomass electricity distributed generation technologies; and (5) co-production of value-added products; and (6) project economics (specifically their costs, performance characteristics and environmental aspects); (7) MSW separation and processing, pollution abatement, recycling and MSW utilization economics; and (8) MSW energy conversion technologies (combustion, gasification, pyrolysis, fermentation, anaerobic digestion and/or landfill gas recovery); and (9) co-production of value-added products (specifically their costs, performance characteristics and environmental aspects).



**48. Wind Technologies.** Demonstrated expertise with: (1) existing and developing wind technology costs, performance, environmental aspects and interconnection issues; (2) techniques to improve performance and reliability and to reduce maintenance requirements; and (3) small wind systems (less than 40 kW) and large-scale wind systems, resource assessment and verification and the current issues affecting the wind technology development and deployment in California.

**49. Solar Thermal Electric and Photovoltaic Technologies.** Demonstrated expertise with: (1) solar thermal electric technologies (e.g., parabolic trough and dish/Stirling, central receiver systems, modular solar thermal electric technologies suitable for distributed generation applications, etc.); (2) photovoltaic (PV) cell technologies, including crystalline, amorphous, thin film and multi-junction devices; (3) PV cell and module qualification and field performance testing; (4) PV balance of systems components, including tracking systems, support structures, storage options and inverters; (5) cost, economic and technical barriers to commercialization; and (6) current costs, projected costs and commercialization plans and strategies.

**50. Low Impact Hydroelectric and Ocean Energy Technologies.** Demonstrated expertise with: (1) existing and new advanced low impact hydroelectric technologies (e.g., impoundments, irrigation canals, in-conduit and run of river applications) suitable for use in California, including capital and operating costs; (2) Federal Energy Regulatory Commission (FERC) licensing issues, environmental impacts and likely mitigation measures; and (3) methods for improving performance or reducing operating costs, and resource assessment capabilities; (4) Ocean energy technologies, including wave energy, tidal and ocean thermal systems, cost and performance, technology developers and manufacturers, environmental permitting issues (specific to California); (5) ocean resource characteristics and availability, resource assessment capabilities (specific to California); and (6) technical, economic and environmental barriers.

**51. Alternative Fuels and Conventional Fuels from Non-Conventional Sources.**

Demonstrated expertise with: (1) the extraction, processing and production of alternative fuels such as hydrogen, methanol, and ethanol; and (2) the extraction of fuels from non-conventional sources, such as natural gas from coal seams and hydrates.

**52. Storage Technologies.** Demonstrated expertise with storage technologies and associated issues such as (1) Compressed Air Energy Storage (and the associated reservoir requirements), including utility systems integration issues, duty cycles, economics, applications and secondary markets/applications; (2) Pumped Hydroelectric Storage Technologies (and the associated reservoir requirements), including utility systems integration issues, duty cycles, economics, applications and secondary markets/applications;

(3) Flywheel Energy Storage including utility systems integration issues, duty cycles, economics, applications and secondary markets/applications; (4) Ultra-Capacitor and Superconducting Magnetic Energy Storage (SMES) Energy Storage including utility systems integration issues, duty cycles, economics, applications and secondary markets/applications; (5) Battery and Alternative Battery Energy Storage including utility systems integration issues, duty cycles, economics, applications and secondary markets/applications; (6) Thermal Energy Storage including utility systems integration issues, duty cycles, economics, applications and secondary markets/applications; and (7) Storage Technologies for energy from renewables.

**53. Renewable Natural Gas Replacement Alternatives.** Demonstrated expertise with finding cost-effective, renewable alternatives to conventional natural gas resources. The expertise will include: (1) improved biogas, including landfill gas and digester gas, technologies for meeting on-site agricultural natural gas use; (2) enhanced methods for cleaning biogas to develop cost-competitive natural gas substitutes; and (3) improved biomass to biogas and thermal gasification conversion methods to increase renewable natural gas alternatives.

**54. Water Heating Alternatives.** Demonstrated expertise with cost-effective alternatives to gas fueled water heating in residential and commercial applications. This will include: (1) low cost, higher efficiency solar water heating for residential and commercial use; and (2) combined renewable electric (e.g., photovoltaics) and solar water heating technologies and thermophotovoltaic water heating technologies.

**55. Process Heating Alternatives for Industry.** Demonstrated expertise with finding cost-effective alternatives to gas fueled water heating, steam generation and drying in industrial applications. The primary focus will be on: (1) renewable fuels for commercial and industrial process heating; and (2) combined concentrating solar power electric/thermal technologies to meet combined heat and power needs. This area was given its priority because of the potential for introducing alternative gas resources within the industrial market sector.

## **Transportation Energy R&D**

**56. Advanced Transportation Fuels and Infrastructure.** Demonstrated expertise with transportation fuels and infrastructure such as, but not limited to advanced petroleum based fuels (oil sands, gas-to-liquid fuels, natural gas) and non-petroleum based fuels (hydrogen, biodiesel, electricity, ethanol) specifically, extraction, processing, production, shipping, storage, distribution and regulatory issues and current costs, economic and technical barriers, commercialization plans and strategies.

- 57. Advanced Transportation Technology and Infrastructure.** Demonstrated expertise with advanced transportation technologies and infrastructure (such as, but not limited to various hybrid-vehicle systems, advanced combustion engines, power electronics and electric motors, advanced component materials and technologies, energy storage systems, fueling systems) to improve efficiency and reduce environmental impacts and current and projected production and manufacturing costs, understanding of economic and technical barriers, expertise in creating and analyzing commercialization plans and strategies.
- 58. Urban and Land Use Planning.** Demonstrated expertise with urban planning, specifically various techniques used in Urban and Land Use Planning (housing, retail, commercial, industrial, light industrial, transit modes and options, agriculture and open space) and quantifying associated energy and environmental effects to reduce energy and environmental effects.

### **RD&D Program Planning and Evaluation**

- 59. Current Energy RD&D and Trends.** Demonstrated broad and deep knowledge of (1) contemporary public and private energy research, development, technology transfer and commercialization programs, participants, practices, objectives, and funding; and (2) energy RD&D trends.
- 60. RD&D Strategic Planning.** Demonstrated expertise with the disciplines of: (1) energy RD&D program management; (2) program planning (including forecasting energy trends, and resource, delivery and end use needs); (3) programmatic and project bench marking and roadmapping; and (4) research target and goal setting.
- 61. RD&D Program Evaluation.** Demonstrated expertise with the disciplines of: (1) energy RD&D program and project evaluation (including application of the stages and gates analysis methodology); and (2) RD&D cost and benefit analysis.
- 62. Economic Issues of Energy - Analysis.** Demonstrated expertise with, and analysis of, the economic issues of energy, including (1) the economic development, subsidy and revenue impacts of various energy development paths, and (2) the theoretical basis, effectiveness and implementation of various types of subsidies, including environmental credits and tax incentives.
- 63. Market Assessment.** Demonstrated expertise in analysis of: (1) technology potential, forecasting potential markets, market penetration forecasting, commercialization assessments, and learning/experience curve effects; and (2) effects of competition on pricing and market size, barriers to deployment, (3) disruptive technology market penetration and development opportunities; and (4) general statistical analysis.

- 64. Public Policy Analysis for RD&D and Technology Transfer.** Demonstrated expertise in the analysis of potential public initiatives for implementing RD&D results, as well as for expanded application of existing energy technologies to address California's primary energy issues. (Some examples of potential initiatives are real time electricity pricing, market incentives, green market initiatives, and subsidies.)
- 65. RD&D Project Proposal Evaluating, Rating, and/or Ranking.** Demonstrated broad and deep knowledge of (1) California contracting/procurement laws, policies and administrative requirements relating to contracts and RFP's, including the Public Contract Code and State Contracting Manual, (2) Common and generally accepted methods and procedures for receiving, evaluating and rating Proposals and bids. It covers the entire source selection process, including acquisition and source selection planning, sole source justifications when applicable, preparation of requests for Proposals, pre-bid conferences, establishment of technical review teams, competitive negotiations, Proposal evaluation, contractor selection, and debriefings and protests This is to include procedures and processes for evaluation of RFPs, and single source, and Non Competitive Bids (sole source).
- 66. Nanotechnology.** Demonstrated expertise in the preparation and characterization of nanoparticles, physical properties imparted by nanoparticle size and structure, and industrial scale fabrication of nanoparticles. Describe expertise as it relates to one or more of the research areas.
- 67. Technology Assessment.** Demonstrated expertise in the assessment of technology. Describe knowledge as it relates to one or more of the research areas.

### **Technology Transfer**

- 68. Technical Writing.** Demonstrated expertise in technical writing, and editing of print and multimedia materials such as technical reports, brochures, fact sheets, documents for web platforms, Digital Video Discs (DVD), Compact Discs (CD), presentations, etc., for audiences with varying levels of knowledge and sophistication.
- 69. Graphics/Design/Printing.** Demonstrated expertise with: (1) use of the newest technologies and possession of the required hardware and software for preparing multimedia presentations and for graphic development and design to publish reports, brochures, fact sheets, documents for web platforms, DVDs, CDs, presentations, etc.; (2) Ability to obtain photographic services and printing and copying services for all types of media; and (3) Demonstrated expertise to develop attention getting fact sheets, brochures and other materials for marketing R&D projects to intended audiences.

- 70. Management Information Systems (MIS).** Demonstrated expertise with the complete life cycle of an MIS business application: (1) business process identification and redesign; (2) planning; (3) design; (4) implementation; (5) project management; and (6) coding.
- 71. Web Site.** Demonstrated experience in the design and maintenance of large and complex web sites, including: (1) a user-friendly framework for organizing and making accessible a variety of material (data, graphics, photos, data base, and other information); (2) layout and design for the content; and (3) organizing, classifying and synthesizing the content material for the web site.
- 72. Facilitate Dissemination of Project and Program Results.** Demonstrated expertise in development of outreach strategies and market and disseminate information to a variety of audiences. Tasks include writing descriptive and technical material, producing or utilizing graphics, development of materials with staff, designers and printers and coordinating with appropriate outlets for targeted distribution of information.
- 73. Organize Conferences.** Demonstrated expertise in arranging and providing conference facilities, logistics, meeting facilitation, and supplies for conferences, workshops, review sessions, and other activities.
- 74. Word Processing.** Demonstrated expertise in processing and preparing complex documents.
- 75. Spreadsheet Analysis.** Demonstrated expertise in analyzing data using spreadsheet programs. Demonstrated expertise in graphical presentation of this information.
- 76. Database Analysis.** Demonstrated expertise in analyzing data using database programs. Demonstrated expertise in preparing reports to present this information.
- 77. Export Control Analysis.** Demonstrated expertise in assisting public and/or private entities in compliance with export control requirements. The issue of export control arises in potential deemed exports of technical data to foreign nationals working on a PIER research project. Assistance is needed in determining whether certain technology and technical data involved in PIER projects are subject to export control requirements, and if so, developing a process to analyze possible license exceptions, or obtain a license.